

CYBERMIX Operating Manual

32 Channel Mixer Automation

English Version 1.0 August 1996

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Safety Instructions

CAUTION :
To reduce the risk of electrical shock, do not remove the cover (or back). No user serviceable parts inside; refer to qualified personnel.

WARNING :
To reduce the risk of fire or electrical shock, do not expose this appliance to rain or moisture.

DETAILED SAFETY INSTRUCTIONS :
All the safety and operation instructions should be read before the appliance is operated.

RETAIN INSTRUCTIONS :
The safety and operating instructions should be retained for future reference.

HEED WARNINGS :
All warnings on the appliance and in the operating instructions should be adhered to.

FOLLOW INSTRUCTIONS :
All operation and user instructions should be followed.

WATER and MOISTURE :
The appliance should NOT be used near water (e.g. near bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool etc.).

VENTILATION :
The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa rug, or similar surface that may block the ventilation openings, or placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.

HEAT :
The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.

POWER SOURCE :
The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.

GROUNDING OR POLARIZATION :
Precautions should be taken so that the menas of grounding or polarization means of an appliance is not defeated.

POWER-CORD PROTECTION :
Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords and plugs, convenience receptacles and the point where they exit from the appliance.

CLEANING :
The appliance should be cleaned only as recommended by the manufacturer.

NON-USE PERIODS :
The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.

OBJECT and LIQUID ENTRY :
Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

DAMAGE REQUIRING SERVICE :
The appliance should be serviced by qualified service personnel when :
- The power supply cord or the plug has been damaged; or
- Objects have fallen, or liquid has been spilled into the appliance; or
- The appliance has been exposed to rain; or
- The appliance does not appear to operate normally or exhibits a marked change in performance; or
- The appliance has been dropped, or the enclosure damaged.

SERVICING :
The user should not attempt to service the appliance beyond that is described in the Operating Instructions. All other servicing should be referred to qualified service personnel.

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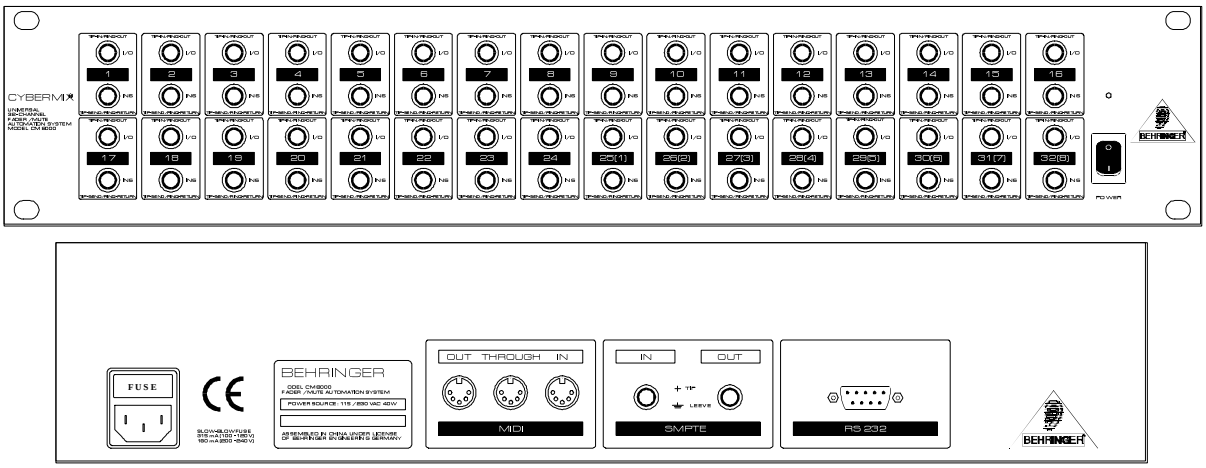
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0. The CYBERMIX System

- Multipurpose 32-Channel Automation System cascadable for up to 119 Channels with Syncs to Film and Music Timecodes
- Mute- and Fader-Automation of Channels, Subgroups, AUX-Sends or Returns and every Line-Level Source
- Two-Rack-space Patchbay with 32 Stereo-Jacks for Console-Inserts and 32-Stereo-Insert-Jacks for Compressors etc.
- High Resolution VCA Control provides extremely wide Dynamic Range from -94 . . . +10dB (max. +21dBu)
- Full Midi-IN / OUT / THRU Interface with MTC-Synchronization
- Integrated SMPTE Synchronizer with analog Reader (Input) and Generator (Output)
- RS232 Interface to Host PC, no Midi-Interface-Card required
- PC CYBERMIX Editor-Software included for Windows™ and Win95™
- Snapshots, On-line-, Off-line-Editing, Visual-Curve-Editor with precise display of SMPTE-Position and Gain in dB.
- All Channels assignable to 8 Virtual Group Faders and one Virtual Master Fader
- Tracksheet- and Notepad-Editor for Comments to the Mix-Session
- Extremely Comprehensive Editing Facilities
- Import Functions even for individual, specified Event Types from other Mix sessions

0.1 CYBERMIX Hardware

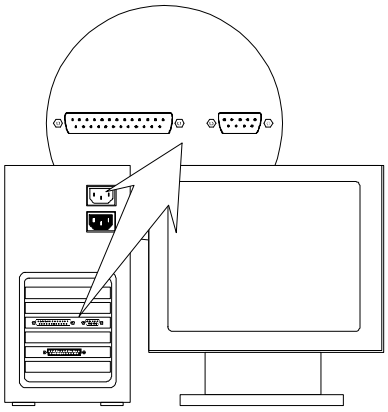


The CYBERMIX Shipping Box comprises the Rack, a two unit high, 19-inch rack-mounted module, a RS232 Interface cable, a RS232 9/25-Pin-Adapter, a power cord and the CYBERMIX Software.
The CYBERMIX is used :

- to control the levels of 32 audio channels
- to receive and to generate SMPTE signals, and synchronize the host to it
- to receive or transmit MIDI Time Code
- to communicate with the IBM PC via the RS232 port
- to buffer upcoming events for absolute precise timing
- to transform Midi-Control Data for subsequent units

0.2 Host Computer

The minimum requirements for the host computer are as follows :



Processor : A 486DX2 with 8MB, while a Pentium 90MHz with 16MB is recommended. A faster processor will improve the speed of the screen updates of fader movements.

Operating System : The computer must be running Windows 3.1x or Windows 95 operating systems.

COM-Port Specs : To connect the CYBERMIX Automation to your PC a free Serial/COM-Port is required. A FIFO 16550 Interface Chip, that drives this port, is necessary to provide the high data rates between rack and host. If you feel uncertain about your PC's configuration you can use software utilities like MS-Diagnostics (this program is included in DOS 6.x and Windows 3.x) to get more detailed information about your PC.

Video Display : The system will run using a 640x480 VGA type graphics card although we recommend using a system with higher resolution such as 800x600 SVGA or even 1024x760 or 1280x1024 with a 2MB PCI-Bus graphics adapter. The higher the screen resolution, the easier it is to simultaneously display and distinguish a larger number of faders. Some Drivers for graphic adapters provide small and large fonts for high resolutions. The CYBERMIX Software supports only the small font option.
(If you find the letters on the toolbar buttons are difficult to read and the letters and numbers within the Mix Events Window have a strange appearance this is the result of a large font-size setting in your graphics-adapter setup).

Hard Disk : At least 10MB of free hard disk space should be available for program and mix data.

Floppy Disk Drive : A 3.5" 1.44MB high density drive is required to initially setup the program.

Mouse : A two or three button mouse, trackball or other device that normally runs with the Windows operating system.

0.3 Hardware Installation

0.3.1 Single Rack Setup

Switch off the CYBERMIX Racks and the Host PC in order to prevent any damage.
Connect the CYBERMIX Automation to the host by using the serial cable. If you only have a 25-pin Sub-D connector on your serial interface card you can insert the 25/9-pin-adapter. The CYBERMIX Software will automatically detect which COM port the rack is connected to and if the communication can be established successfully. No further calibration or adjustment is necessary, because the Software also configures the port automatically. Please be sure that your PC is equipped with a FIFO Serial Interface (see chapter 0.2). In most cases problems (e.g. the PC locks up) that occur while you are working with the CYBERMIX Software can be attributed to a slow COM Port !
Note : The CYBERMIX Automation must be switched on before you start the Software. Otherwise the Software is not able to detect the CYBERMIX.

0.3.2 Multi Rack Setup

Switch off the CYBERMIX Rack and the Host PC in order to prevent any damage.
Now you connect the first of the CYBERMIX Automations to the Host by using the serial cable. If you only have a 25-pin Sub-D connector on your serial interface card you can insert the 25/9-pin-adapter. All subsequent Automations are connected via MIDI cable. The first unit translates the computer data into MIDI commands. The table below gives you an idea about the Channel per Rack ratio in a multi rack setup.

Number of Automations	Number of Channels	Number of Virtual Groups
1	32	8 + 1 Virtual Master
2	64	8 + 1 Virtual Master
3	96	8 + 1 Virtual Master
4	119	8 + 1 Virtual Master

0.4 Software Installation

Please make a copy of your original data-disk and close all active Windows applications before you start installing the software.

- With the Windows operating system running, place the CYBERMIX Installation Disk in the 3.5" floppy-drive.
- From the PROGRAM MANAGER select File Menu; now select the *RUN* menu item.
- In the command line type the following : A:SETUP.EXE (if your floppy drive is B then type B:SETUP.EXE) followed by Return.

The software will now install automatically on your hard disk. The software will suggest the drive and the directory into which it will install. You can change this if you wish, or simply hit ENTER to accept the default destination.
You can now remove the CYBERMIX Installation Disk and store it somewhere safe in case you need to reinstall the system at some future date.
After the software installation is complete, you will be presented with a new Windows program group called BEHRINGER CYBERMIX.

To start the CYBERMIX Software :

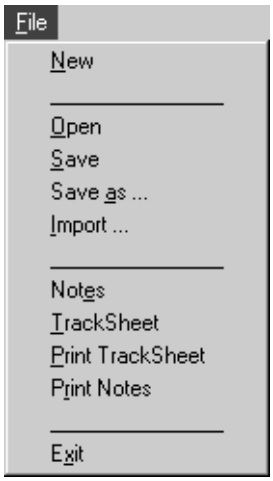
1. first switch on the CYBERMIX Rack
2. start the program by double-clicking on the CYBERMIX icon.

During start up, the CYBERMIX Software checks the presence of the CYBERMIX Rack and configures the COM port. If the rack has not yet been connected or is still switched off the error message "No Rack Communication" will be displayed. In this case the software can be run in Demo Mode.

1. Menus & Toolbar

The Menus can be opened by a left-mouse-button click on the menu name or by pushing the *Alt*-button together with the underlined letter-button within the menu name (i.e. to open the View-Menu push *Alt* + *"v"*).

1.1 File Menu



The File Menu provides access to all basic functions of the program such as opening, saving, leaving some information about the mixes, printing data and exiting the program.

New
This entry calls up the Mix Settings Window to set up a new mix-session (see chapter 4.1).

Open
This entry calls up the Open Window to load a previously saved mix-session to the screen (see chapter 4.1).

Save
This entry saves the actual session. If the mix-session is saved for the first time this entry corresponds to the *Save as* menu entry (see chapter 4.1).

Save as
This entry calls up the Save Window to save the actual mix-session to disk and asks for the session name and path to save it to (see chapter 4.1).

Import
This entry calls up the Import Window to copy certain elements from another mix-session to the actual session (see chapter 4.4.6).

Notes
This entry calls up the Notes editor. You can ad comments or any other general information you want to save together with the mix-session. This Editor can be regarded as an addition to the Tracksheet entries (see chapter 2.5).

Tracksheet
This entry calls up the Tracksheet Window to label the track, specify names of the recording engineers, etc. (see chapter 2.4).

Print Tracksheet
This entry starts the printing of the session's Tracksheet on your standard output device. Refer to your Windows manual for more information about installing or activating a printer on your system.

Print Notes
This entry starts the printing of the session's notes.

Exit
This entry exits the program.

1.2 Edit Menu



The Edit Menu allows you to perform a variety of very powerful operations on data that has already been recorded and now needs to be modified.

Undo
This entry is used to undo the last action.

Update Mix
This entry can be used to trim the level-data or mute-data of selected channels in a specified region (see chapter 4.4.1).

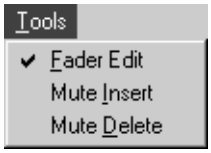
Copy Fader
This entry is very useful for duplicating fader events (e.g. Fade-Ins or Outs) from one channel to one or more channels, or from one position to another (see chapter 4.4.2).

Copy Snapshot
This entry allows you to copy a previously stored snapshot to any other position, and to specify which channels shall be affected from this operation (see chapter 4.4.3).

Copy Mix
This entry allows you to copy a complete area of a Mix, including all dynamic or snapshot events, to another position, e.g. for copying Refrain #1 with all dynamic events to Refrain #2 (see chapter 4.4.4).

Delete Events
This entry helps to erase all events from a specific area on one or more tracks in order to be sure that no residual mix data exists at this position (see chapter 4.4.5).

1.3 Tools Menu



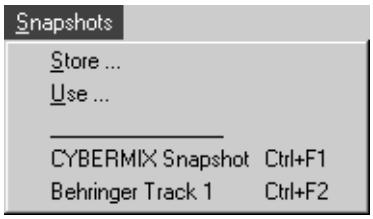
The items in the Tools Menu refer to operations in the Mix-Event-Editor, where all the mix events are represented graphically on a virtual time-line. If one of the three options is active you will find an indicator in front of the option.

Fader Edit
This entry is used to design gain progressions such as fades on the screen with a "rubber-band" mouse function. It is only possible to edit the faders within the Mix Events Window if this option is active (see chapter 4.3.3).

Mute Insert
This entry is used to insert mutes into the mix events (see chapter 4.3.4).

Mute Delete
This entry is used to delete a mute within a specific area in the mix (see chapter 4.3.4).

1.4 Snapshots Menu



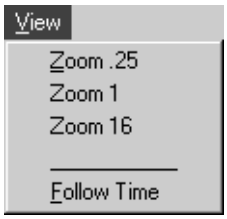
A snapshot is a recording of all fader positions and channel mute status. A snapshot can be recalled at any time and all mutes and faders will immediately move to the positions recorded. In every session you can use up to nine different snapshots.

Store . . .
This entry calls up the Store Snapshot Window to specify a name for the snapshot on the screen and save it (see chapter 4.3.7).

Use . . .
This entry calls the Use Snapshot Window to load a certain snapshot for further use or to delete a previously recorded snapshot (see chapter 4.3.8).
Note : You can only load snapshots that have been stored during the actual mix. To load a snapshot from another mix use the *Import* function from the File Menu.

Snapshot List
If at least one snapshot has been made during the current mix session, the lower part of the Snapshots Menu will show the name and its corresponding keyboard shortcut. The snapshots correspond to shortcuts *CTRL + F1*, . . . , *CTRL + F9* in the order of their listing, which does not need to be the order of their occurrence (see chapter 4.3.8).

1.5 View Menu



The menu items refer to display-presets for the Mix-Events-Editor.

Zoom
These three entries change the resolution of the time axis within the Mix Events Window (see chapter 4.3.6).

Follow Time
This entry activates the display of the Song Position Pointer (SPP), running whenever a Time Code signal is detected. At start-up, when the Time Code is running, the time line will follow on screen at the same time. If you find that this affects the timing of the fader movements, then you are given the option of turning off the following.

1.6 Window Menu



The first four options in this menu automatically arrange all of the windows on the screen in various different formats.

Cascade
This entry arranges all of the windows on top of one another, with their title bars visible at the top. This enables you to select, and bring to the front any window required.

Tile Horizontal
This entry arranges the Channels and Groups Windows horizontally in such a way that they utilize all of the available screen, yet are all present.

Tile Vertical
This entry arranges the mix Channels and Groups Windows vertically in such a way that they utilize all of the available screen, yet are all present.

Arrange Icons
Selecting this item will arrange any window icons so that they are present in a neat row along the bottom of the window. This is useful if you have lost an icon underneath another window or off the screen.

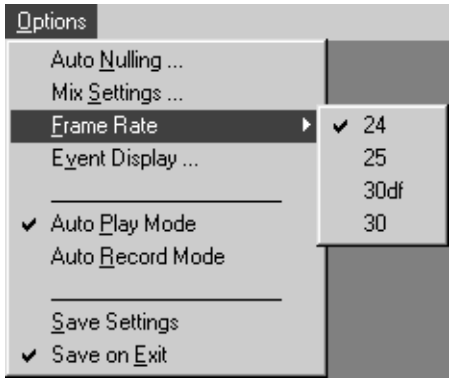
Restore
Clicking on this option will arrange all windows on the screen to the positions they were in when the mix was last saved.

Toolbar Visible
This option removes the Toolbar from the screen or makes it visible.

Window Selection
The next four commands, when selected will bring that window to the front of all the others and activate it. Another useful command when a window has been closed or hidden behind other windows.

1.7 Options Menu

This menu allows you to set up various components of the software configuration, for compatibility with your hardware and also for some customization. You can also determine the number of channels and virtual subgroups that shall be used in your session.

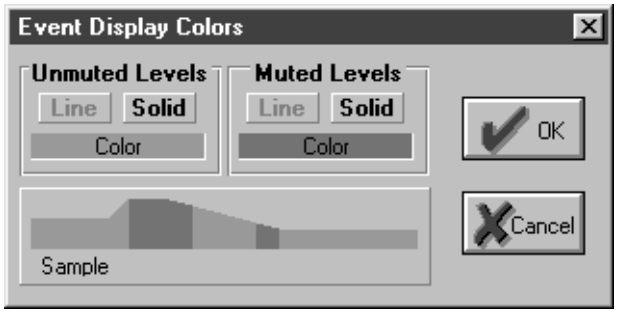


Auto Nulling . . .
The *Auto Nulling* option displays the Auto Nulling Window. To enable the Auto Nulling, highlight the check box at the top of this option box, or press the *Auto Nulling* switch on the Toolbar (see chapter 3.3).

Mix Settings . . .
The *Mix Settings* option displays the Mix Settings Window which allows you to enter a title for the mix, change the value of the Start Time and Initial Length (see chapter 4.1).

Frame Rate
This option allows you to set up the Time Code reading to match that of the source. The options are 24, 25, 30 and 30dp (drop frame) frames per second.

Event Display . . .
This option window is used for adjusting the graphical Mix Events Colors of both the levels and the mute events in the Mix Events Window. Either can be set for solid or line display. Also, either can be set to any of the colors available on the current display. The defaults are solid blue for unmuted and red outline for muted events.



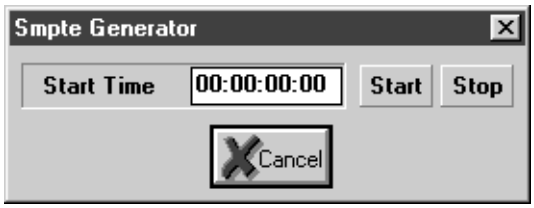
Auto Play Mode
This option allows for faders and mutes to switch into Play Mode after events have been recorded on this channel, and the time code is stopped (see chapter 3.1.1).

Auto Record Mode
This option allows for faders and mutes to switch into Record Mode automatically when fader position or mute status is changed, while Time Code is running (see chapter 3.1.1).

Save Settings
Selecting this option will save all of the above options, and all window positions and sizes to disk, so that when the software is reloaded it will all be identical.

Save on Exit
If this option is tagged when the program is quit, then all of the above options, and all window positions and sizes will be saved to disk.

1.8 Smpte Menu



This window allows you to generate the SMPTE signal that can be used to encode a tape.
You only have to enter the start time and press the *Start* switch to provide a continuous timing reference at the SMPTE Output jack and the *Stop* switch to end generation of the Time Code.
If the Time Code Signal is fed back from the tape recorder PB head to the SMPTE Input jack of the CYBERMIX the constantly present Real Time Counter (SMPTE counter display) changes its color to red and shows the actual Time Code Position (see chapter 4.5). Press the *Cancel* button to exit from the SMPTE Window.
Note : The *Cancel* button does not stop the SMPTE-Generator, but only closes the SMPTE-Generator Window.

1.9 Toolbar



Save
This button corresponds to the File Menu entry *Save*.

Undo
This button corresponds to the Edit Menu entry *Undo*.

Fader Edit
This button corresponds to the Tools Menu entry *Fader Edit*.

Mute Insert
This button corresponds to the Tools Menu entry *Mute Insert*.

Mute Delete
This button corresponds to the Tools Menu entry *Mute Delete*.

Update
This button corresponds to the Edit Menu entry *Update Mix*.

Fader
This button corresponds to the Edit Menu entry *Copy Fader*.

Snap
This button corresponds to the Edit Menu entry *Copy Snapshot*.
This button can only be activated if one or more snapshots have been stored during the current mix.

Mix
This button corresponds to the Edit Menu entry *Copy Mix*.

Del
This button corresponds to the Edit Menu entry *Delete Events*.

16, 1, 0.25
These buttons correspond to the View Menu entries *Zoom xx*.

Auto Nulling
This button corresponds to the *Auto Nulling Enabled* button within the Auto Nulling Window that is activated by the Options Menu entry *Auto Nulling*.

Auto Play
This button corresponds to the Options Menu entry *Auto Play Mode*.

Auto Record
This button corresponds to the Options Menu entry *Auto Record Mode*.

Use
This button corresponds to the Snapshots Menu entry *Use*.

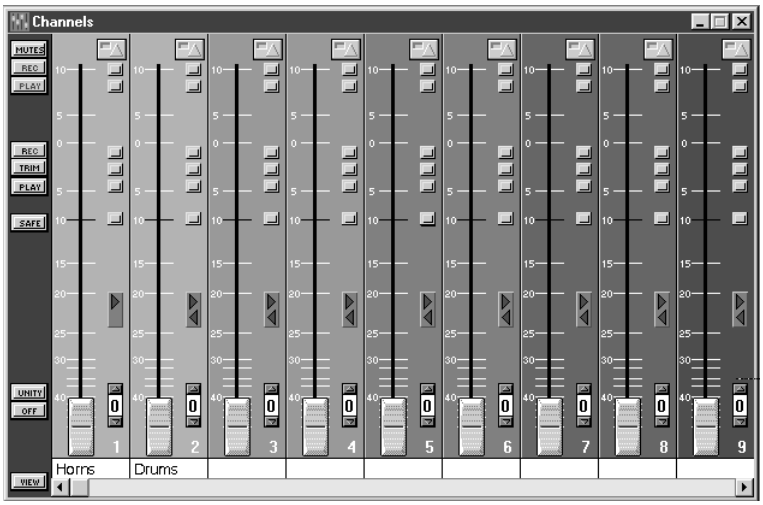
Store
This button corresponds to the Snapshots Menu entry *Store*.

2. The CYBERMIX Windows

The CYBERMIX Automation program consists of four individual windows, one Notes Editor and a Real Time Counter Panel.

Window size : You can alter the size of the CYBERMIX Windows by dragging a corner of the window using the mouse. See your Windows manual for more information about re-sizing windows. Within the two Fader Windows you find the switch *VIEW* in the lower left corner, which also allows you to alter the window size.
Whenever the CYBERMIX Program is running, one of its windows is designated as the active window. This will normally be whichever window you last used or clicked over. You can tell which window is active by the color of the title-bar, which is normally different for active and inactive windows. See your Windows manual for more details.

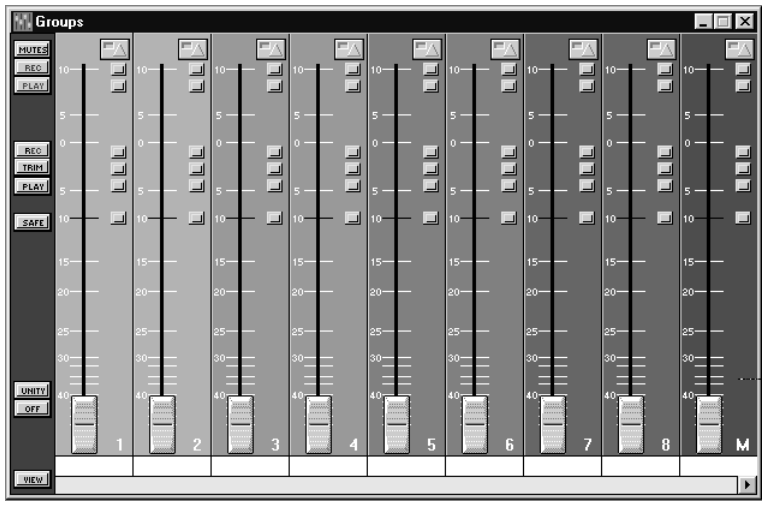
2.1 Channel Faders



The Main Fader Window displays the fader and mute controls for each automated channel and allows you to alter these controls during a mixdown pass using the mouse. The controls are similar to those on a mixing desk and give you a familiar feeling while working with the virtual mixing console. To change a mute status, click the *CH MUTE* button (see chapter 3.1.1) with the mouse. To move a fader, click on the fader track or directly on the fader button, hold the left mouse button down while moving it up and down. The fader will move with the mouse pointer. When you have positioned the fader as you want it, release the mouse button.
Each alteration of a setting can be recorded as an event. The program stores the sequence of events in the Mix File and displays the events in the Mix Events Window. A complete set of events for a whole mix can be saved to disk, and reloaded later.

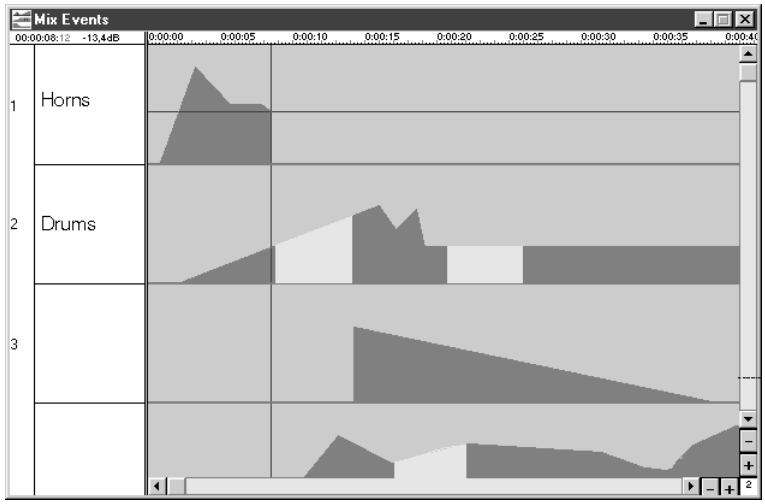
2.2 Group Faders Window

The Automation Program allows you to link several channel faders together in eight virtual groups, so that you can control their VCA level with a single fader.
The Master fader controls the VCA level of all channels at the same time.



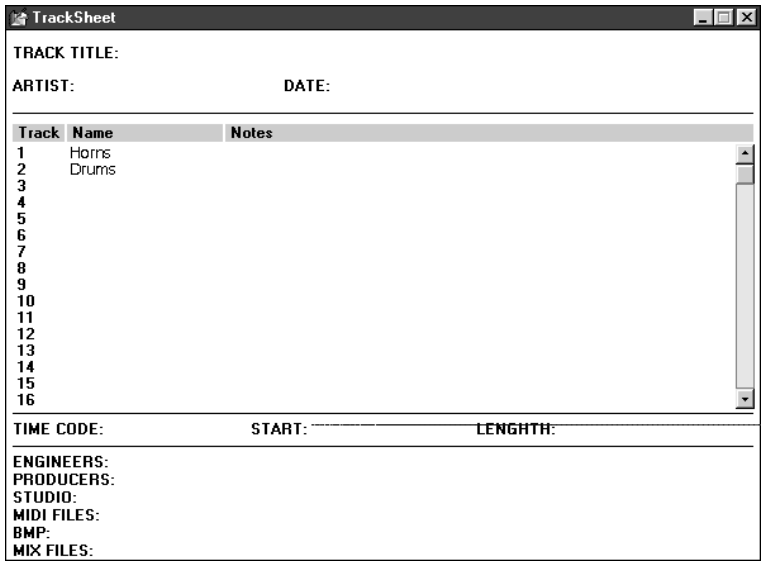
2.3 Mix Events Window

The Mix Events Window allows you to edit the levels and the mutes for each channel, virtual group and virtual master along a time line.



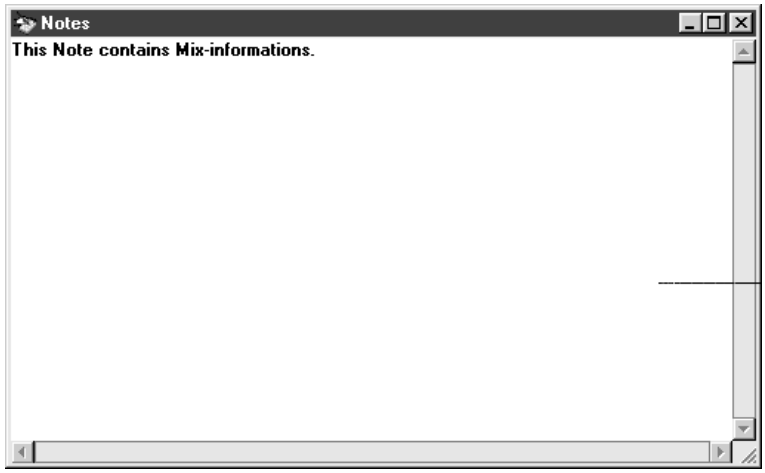
2.4 Tracksheet Window

The Tracksheet saves information about track titles, artist, mix title etc. into a tabularised formal listing.
Any relevant information you wish to insert can be put into the various areas in this window and it is saved automatically together with the mix. The track names or labels that you specify here will be displayed beneath the corresponding tracks within the Channels and Groups Windows. Within the Tracksheet the names are displayed beside the track number.



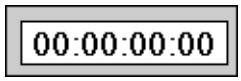
2.5 Notes Editor

In case you want to save even more mix information than is possible within the Track Sheet, you can use the Notes Editor. The notes are also saved together with the mix.



2.6 Real Time Counter Panel

The Real Time Counter gives the actual Time Code position while playing a mix.
The time format is :



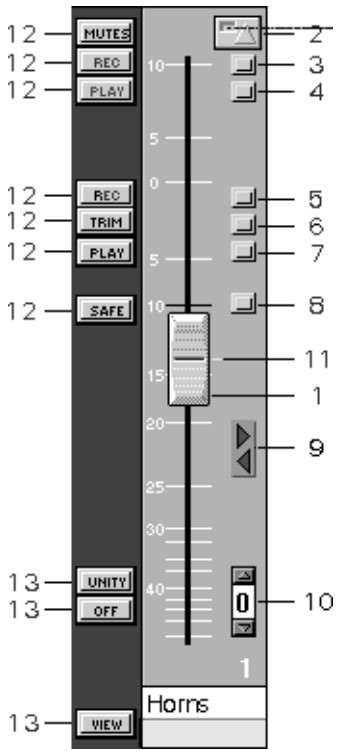
hours : minutes : seconds : frames

The Real Time Counter can be moved all over the screen by clicking and holding down the left mouse button on it . Move the panel around and release the mouse button to drop the panel at its destination.
Note : The Real Time Counter Panel is always visible and displayed in front of all other windows (even when you switch to another program the counter is visible).

3. The CYBERMIX Controls

3.1 Channel Faders

Depending on the display resolution and the number of channel faders you use, it is possible that some channels will be invisible. You can use the scroll bar at the bottom of the Channel Faders Window to display the faders you want.



3.1.1 Control Buttons

All switches are controlled by clicking with the left mouse button.

Channel Fader Knob (1)
The Fader-Knob can be moved up and down like on a real mixing console. To move a fader, click somewhere on the fader track. While holding the left mouse button down, you can move the mouse up and down and the fader will follow its movement. Position the Fader where ever you want and release the mouse button. Beside the Fader Track you can read the Channel level from the dB-scaling.

Channel Mute Button (2)
This switch "mutes" a single channel in the same way as on a real mixer. If this switch is active, the red control lamp lights up.

Mute Record Mode Button (3)
This switch controls the Mute Record Mode of each channel. Mute Record Mode means that all changes, made to the Mute Status of a channel, are recorded as Events, while Time Code is running.
Note : If the Auto Record Mode from the Options Menu is selected and you change the Mute Status of a channel, it is possible to activate the Mute Play Mode automatically (see next paragraph and chapter 1.7).

Mute Play Mode Button (4)
This button switches the Mute Play Mode of a channel on or off. When this mode is active, the pre-recorded Mute-Events of a channel are played, while the Time Code is running.
Note : The Mute Play Mode can be activated automatically, when *Auto Play Mode* from the Options Menu is selected and a recording pass ends on a specified channel.

Fader Record Mode Button (5)
With this mode active any changes made to the Fader-Position are recorded as events, when Time Code is running.
Note : The Fader Record Mode Switch can be activated automatically, while *Auto Record Mode* from the Options Menu is selected.

Fader Trim Mode Button (6)
While in Trim Mode any prerecorded fader movements are played. But you always have the chance to change the level of the fader by hand. These new movements are recorded as well.

Fader Play Mode Button (7)
If a fader is in Fader Play Mode (this mode can be activated by pushing this button), any prerecorded fader movement will be reproduced.
Note : If the command *Auto Play Mode* from within the Options Menu is active, this button can automatically be activated, after a recording pass ended.

Isolate Mode
When a mode switch of a channel is turned on, this switch changes its color. If all indicator lamps are gray (that means the switches are off), we call this the Isolate Mode. This Isolate Mode is for either faders or mutes.
During Isolate Mode any recorded event is ignored and any movement of faders and mutes is directly worked out by the Automation Rack.

Safe Button (8)
While a channel is in Safe Mode all its controls are locked, except the Stereo Channel Link Button and the Group Number Selector. Every prerecorded event of this channel is kept safe and is played exactly the way it has been recorded. You can tell the Safe Mode of a channel by the plain Control Buttons, that means all these buttons are locked.

Stereo Channel Link Button (9)
Two neighbored channels can be „linked" and thus used as a Stereo Channel. Any changes that you make to one of the linked channels is also transferred to the second channel. While the Link Function is active it is indicated by a triangular Indicator Lamp on each channel.

Group Number Selector Button (10)
You can link a channel to one of the 8 virtual groups (see chapter 3.2.1).

True Gain Indicator (11)
While playing or trimming a prerecorded mix this True Gain Display shows the actual VCA gain.

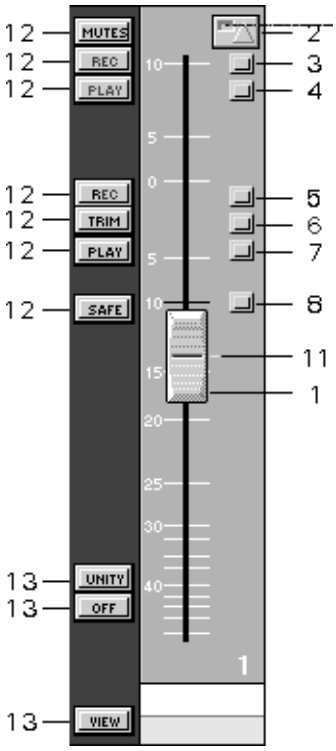
3.1.2 Master Edit

Channel Master Buttons (12)
On the left side of the Channel Fader Window you find some Master Buttons, which represent the Record, Play Trim and Safe buttons of each channel. If one of these master buttons is On, this means that its function influences all channels. I.E. if the Master Record Mode is active, this has the same effect as if all Channel Record Buttons are turned on.

Master Buttons (13)
You will find 3 other Master Buttons in the Channel Fader Window. The Unity Button sets the channel level to 0 dB, the Off Button switches the channel off by setting the Channel Fader to -OO dB. The View Button changes the resolution and size of this window.

3.2 Group Faders

It is possible to link channel faders to virtual groups. This feature allows you to control several channels with only one fader.
The Master Fader controls the level of all faders at the same time.
The controls of the Groups Window and their function are the same as in the Channel Fader Window, except for the Channel Link Buttons and the Group Number Selectors. Please refer to the descriptions in chapter 3.1.



3.2.1 Assigning Faders to Groups

You can link a channel to one of the 8 virtual groups. Push the triangular button above the channel number to increase the counter or the lower button to decrease the channel counter, to set the desired group. If "0" is displayed, this means that this channel is not linked to a group.

3.2.2 Virtual Master Fader

The Virtual Master Fader is part of the Group Fader Window. This fader controls all Channel and Group Faders at the same time.

3.3 Mix Events

Mix Events
The CYBERMIX Automation Software records all changes, made to the Fader Levels and Mutes as "Events". These so called Mix Events are shown graphically within the Mix Events Window on a Time Line. The fader position of a particular channel corresponds to the height of a colored bar. The Mutes are also displayed as a colored bar or line (see chapter 4.3).

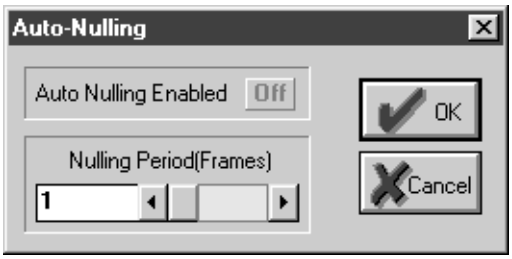
Zoom
You can increase details within the Mix Events Window on the time line as well as on the gain line (see chapter 4.3.6).

Nulling
This is for use during the trimming of a mix. When a channel is recorded, and on a second pass the Trim Mode is used, any adjustments made to the fader position are then superimposed on the current fader level. When you exit the Trim Mode you can be left with a large difference in level between the adjusted section and the original pass. Nulling is used to make this jump smoother.

Manual Nulling
To exit the Trim Mode, press the play button which switches the fader to Null Mode. Null Mode is indicated with the yellow and green lights both lit and the red light flashing. The red light continues to flash until the fader is set, manually, to the -10dB point at which time it will immediately snap into Play Mode. The rate at which the trim is brought back to the null position is entirely up to you and how fast you move the fader back.

Auto Nulling

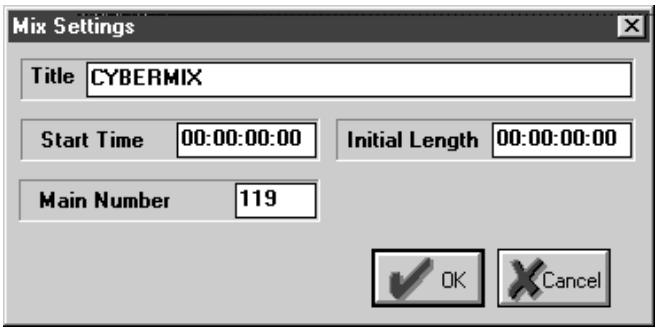
Auto Nulling is exactly the same, but when the play switch is pressed, the computer returns the fader to null position (-10dB) automatically at a predetermined rate.
Choose *Auto Nulling* from the Options Menu or press the *Auto Nulling* switch on the Toolbar. The Nulling Period scrollbar defines how long the fader will take to return the fader to the null position. The maximum is 100 Time Code frames.



4. Mixdown

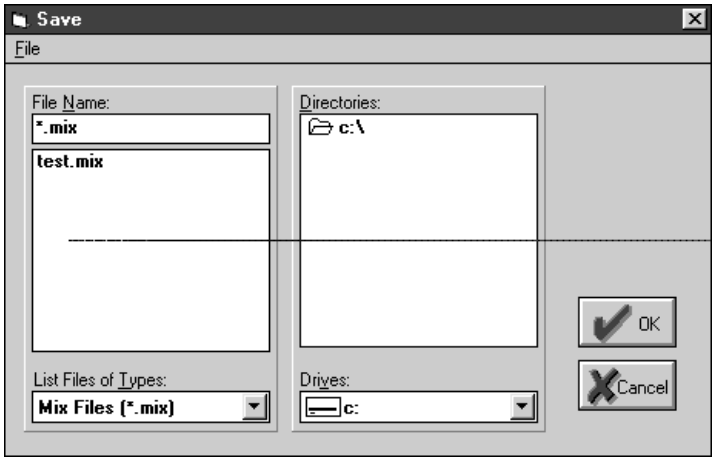
4.1 Starting, Loading and Saving a Mix

Starting a New Mix



The *New* command from the File Menu clears all current mix information. It has the same effect as quitting and rerunning the program. If there is any unsaved information in the current mix file, the program will ask you to save or discard this information before proceeding.
The program then displays the Mix Settings Window which allows you to enter a title for the mix.
You can change the value of the Start Time and Initial Length by clicking on their boxes and entering the required times with the keyboard.
If your mix does go past the end then it will record additional events, and the computer will automatically adjust the length accordingly.
If you use more than one automation unit or a mixer console with a different number of channels, you can change the number of Main faders; the number of group faders is fixed to 8 faders.
Note : A title is not the same thing as the mix's filename. Titles are provided for your own convenience, and are not used by the program. You do not have to enter a title if you do not wish to do so. The title of a mix is displayed within the title bar of the Mix Events Window.

Saving a Mix



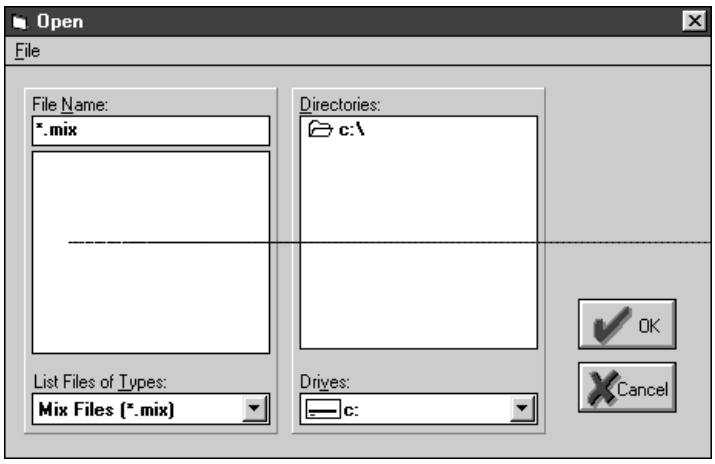
When a mixing session is over, the entire mix including all events, channel names, groupings, snapshots, notes and tracksheet information can be saved to the computer's storage medium for retrieval at a later time.
This is done using the *Save* icon found in the Toolbar or by selecting *Save* from the File Menu. This brings up the Save Window.
This window has basically four main areas, the large box on the left gives you a listing of all of the files in the current directory which match the file type described by the box below. This allows you to check for current file names. Also, if you select a file listed in this window, its filename appears in the box at the top left of the window as a short-cut to typing it all out.
Note : If you now save the mix under this filename, it will overwrite the original version.
Alternatively, you can use the filename box at the top left to manually type in the filename required.
Note : If you have selected Mix Files (*.MIX) in the file type box, it is not necessary to add a file extension as the software will automatically add the .MIX extension.
The small box to the bottom right of the window is used for selecting the drive onto which the mix will be saved. This is usually the hard disk drive of the computer but can be any recording device which is set up for use.
When a medium has been selected, the larger box to the right then lists all of the directories available. Double clicking with the left mouse button on various directories listed allows you to select the required directory into which the mix will be saved.
When a filename and directory have been selected, pressing the OK button will save the mix and return you to the main program. Pressing the Cancel button will abort the save process and nothing will be saved.

Opening a Mix

Opening (or loading) a previously saved mix into memory is almost identical. However if there is any unsaved mix data in memory when you select *Open* from the File Menu, the program will ask you if you wish to save the current mix first.

This works in exactly the same way as the Save Window, with the obvious exception that it loads the mix into memory as opposed to saving the current one to disk.

Note : Any file opened will overwrite any mix currently held in memory.



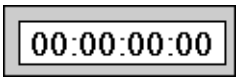
4.2 Real-Time Mixing

Real Time Mixing

The CYBERMIX Automation Program records and synchronizes Mixdown Events (fader movement and mutes) using Time Code, which must be supplied as quarter-frame MIDI Timecode (MTC) or SMPTE signal from an external source.

When Time Code is running, fader movements and mute on/off events can be recorded in real-time using the on-screen controls in the Fader Windows, as with a standard mixdown.

4.2.1 Basic Event Recording



In order to record or play back a mix, an external Time Code source is required. This is used by the software to synchronize the events accurately in time, relative to the audio signals.

The CYBERMIX Automation Unit has an additional memory where the events are loaded in advance to the current Time Code, so that the events are synchronized accurately in time, independently of the PC program response.

The floating Time Code panel displays the current Time Code, in the format :

Hours : Minutes : Seconds : Frames

4.2.2 CYBERMIX Automation Events

The CYBERMIX Automation Software records the changes in fader position and mute status as "events". These events are shown graphically in the Mix Events Window, with the time running from left to right. Fader levels of a specific channel are shown by the height of the color bar. If a mute is active on that channel then the color bar changes to another color for the duration of that mute.

Note : It is possible for the user to alter these colors as preferred (see chapter 1.7).

4.2.3 Recording Fader and Mute Changes

There are two ways to store fader and mute events in the CYBERMIX Automation. On-line recording is done in real time, for example, as the tape machine is playing the mix. Off-line editing is done if no Time Code is running. The user can manually adjust the times and the levels of events within the Mix Events Window by drawing them with the mouse along the time line.

4.2.4 Playing the Mix

When a channel's mute and fader controls are set to Play Mode and the Time Code is running, the fader levels and mute on/off settings which have been recorded on the previous passes are implemented by the program using VCAs in the CYBERMIX Unit.
When playing through a mix, it is possible to have some channels in Record Mode with others in Play Mode. This allows you to adjust one channel at a time, with the others playing back materials recorded on them in previous passes (see chapter 3.1.1).

4.2.5 Trimming the Mix

Another way to record fader adjustments through a mix is the Trim Mode. Each channel has a Trim Mode and it is used, not to record the levels for a particular channel, but to trim them up or down for a period of time (see chapter 3.1.1).
When you switch a channel into Trim Mode, both the yellow trim button and the green play button light up. In Trim Mode, the fader moves to the -10dB red mark on the attenuation scale (about halfway up the fader track), and a True Gain Indicator (a tiny red line) also appears beside the fader track.
When you start the Time Code, the True Gain Indicator moves in accordance with the recorded fader levels, and shows what the fader level is really doing the mix-down pass. If you do not move the fader during the pass, the old fader levels are not affected.
However, if you "pick up" and move the fader with the mouse during the pass, the play button goes out, and the red record button lights up to show that the changes you are making to the fader levels are being added to the mix. The True Gain Indicator also turns red. The fader movements you make adjust the recorded level, so that you can increase or decrease the levels recorded on previous passes by moving the fader up or down.
Note : While you are in Trim Mode, the True Gain Indicator shows the real fader level, and the fader itself shows the adjustment you are making, relative to the -10dB mark, so that the absolute dB scaling is no longer applicable. But you can use the dB scaling as a relative scaling.
Example : Let us assume that the True Gain Indicator points to -40dB, the fader is set to -10dB. Moving the fader to the +10dB mark will cause the True Gain Indicator to shift to the -20dB mark.

4.3 Basic Event Editing

When a mix pass has been completed, the chances of it being exactly right are minimal. Therefore, the CYBERMIX Automation software allows you to move any event in time or between channels, delete or create events, and copy events between or within channels.

4.3.1 Off-Line Editing

When Time Code is not running, fader changes and mute events can also be inserted or edited at specific time positions using the controls in the Tools Menu and Edit Menu. As well as inserting and deleting events, the off-line editing system also allows you to adjust the timing of recorded events, so that an event (a mute on/off or fader level change) which was recorded too early or too late can be copied to a different time without rerunning the mixdown from tape.

4.3.2 Adding Events

Each fader level and mute on/off event for each channel is shown in the Mix Events Window. New fader levels can be altered by selecting the *Fader Edit* tool and positioning the mouse cursor where you want to start the alteration, clicking the left mouse button and dragging the mouse to another level and time position. At this position you can click the right mouse button to end the alteration, or click the left mouse button to start a new alteration. At any position, you can cancel the alteration by using the *Esc* key. But at the end of the alteration, you have to use the UNDO tool to cancel the last alteration.
Mutes can be inserted or deleted anywhere by selecting the Mute Insert or Mute Delete tools, in the same manner as the fader level alterations (see chapter 4.3.3 and 4.3.4).

4.3.3 Editing Fader Levels

To edit a Fader you first have to click on the Fader Edit toolbar button or select *Fader Edit* from the Tools Menu. The cursor arrow becomes a small cross whenever it is moved through the Mix Events Window. The top left corner will show the exact time and gain position of the cross. The first click on the left mouse button will begin a "rubber-band" gain editing function in that specific channel. Every subsequent click on the left mouse button will set a mark on the time line. The blue region between two steps represents the linear transition from one gain setting to the next, e.g. fades or jumps of volume. A click on the right mouse button will mark the last step. You can continue a previously drawn line by simply moving the cross to the time where you want to begin and pressing the left mouse button. The editing will begin automatically with the last gain value at that time. Press the *Esc* key, if you want to cancel the actual editing process or the UNDO toolbar button to cancel the last action.

4.3.4 Inserting and Deleting Mute Status

Mute Insert
The same procedure is applied for editing the mutes. Click on the Mute Insert toolbar button or select the *Mute Insert* command within the Tools Menu.
Place the mouse cursor where you want to start the mute (channel and time position). The mouse cursor changes its appearance into "curtain". Drag the curtain over the area that is to be muted. The second mouse click (left or right mouse button) ends the muted area and the channel level color changes from blue to red within the muted area.
At any position you can cancel the alteration by using the *Esc* key. At the end of the alteration you have to use the *UNDO* tool to cancel the last alteration.
Note : To change the color settings see chapter 1.7.

Mute Delete
Click on the Mute Delete toolbar button or select the *Mute Insert* command within the Tools Menu.
The method to be applied for deleting mutes is the same as for Mute Insert, with the exception that only mutes are affected.

4.3.5 Undoing Mistakes

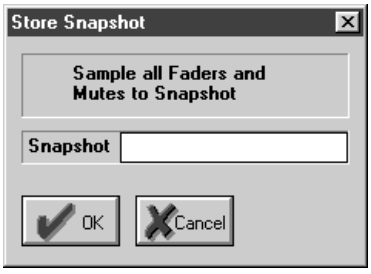
If during editing you make a mistake, for example copying events to the wrong channel or deleting work, you can undo it using the *Undo* tool. This will take back the last command issued, returning the channels to the status they were in before the command.

4.3.6 Zooming into Mix Events

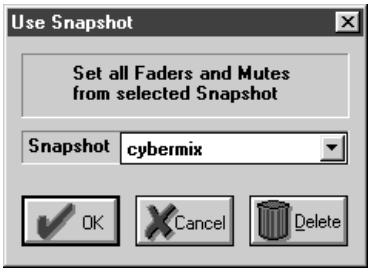
In order to make fine adjustments accurately in the mix, you need to be able to enlarge the area to be edited. This can be done using the *Zoom .25*, *Zoom 1* and *Zoom 16* tools, or selecting *Zoom* from the View Menu.
Another method for displaying more Mix Events Details is to use the buttons located at the bottom right hand corner of the Mix Events Window. There is a pair of +/- tools. Pressing the + button displays more time but less detail while the - button displays less time but more detail.
At the right of those tools you can read the Frame / Pixel ratio.
The vertical +/- tools allow you to display more or less channels down the screen. Pressing the + button displays more channels but in less detail, while the - button displays less channels but in more detail.

4.3.7 Storing a Snapshot

A snapshot is a recording of all fader positions and channel mute status. A snapshot can be recalled at any time and all faders and mutes will immediately jump to the positions recorded.
To store a snapshot use the command *Store* from within the Snapshots Menu. You are asked for a name for the snapshot.



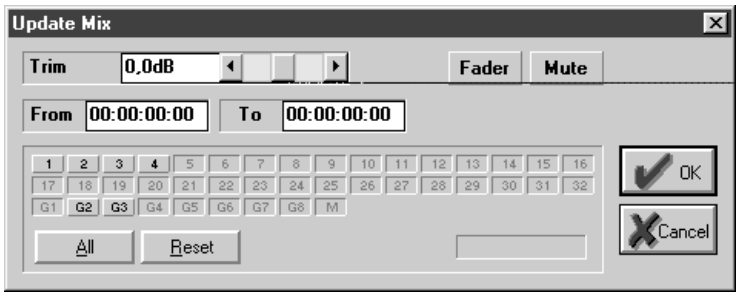
4.3.8 Recalling or Deleting a Snapshot



To recall a snapshot press the *Use* switch or select *Use* from the Snapshots Menu (you are then presented with the Use Snapshot Window) or select the name of the snapshot directly from the list within the Snapshots Menu.
Note : The toolbar-button and the menu-option can only be activated if at least one snapshot has been recorded before.
From within the Snapshot box, pressing the roll down switch will give you a complete list of all the snapshots currently in memory. Highlight the one to be used (or deleted) and the list rolls back up leaving the selected snapshot in the window.
At this point you have three choices, Cancel will simply exit from this feature, OK will implement the recall that particular snapshot and Delete will delete the sample from the list.
As each snapshot is recorded, it is designated with a number. Another way to recall a snapshot is to press the *Ctrl* key and the key *F1* to *F9* on the main keyboard.
Note : Deleting a snapshot from the list moves all subsequent entries up one place in the list, thereby changing the keyboard shortcut references for them by one.

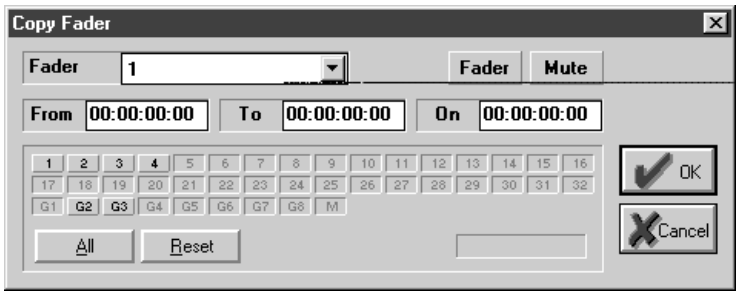
4.4 Advanced Event Editing

4.4.1 Updating the Mix



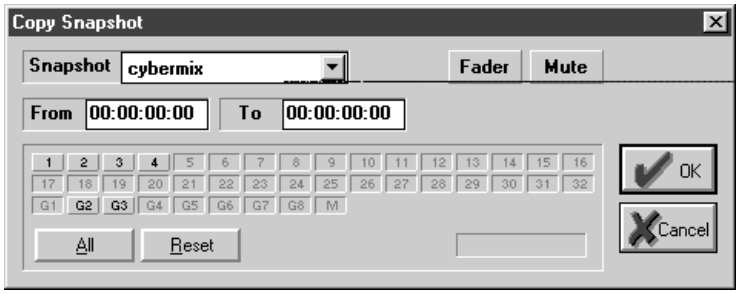
Each channel level can be trimmed up or down for a period of time.
To update the mix, press the *Update* toolbar button or select *Update Mix* from the Edit Menu. You are then presented with the Update Mix Window.
With the Trim scrollbar, set the required update level from -100dB to +100dB, and select the mute status with the button neighboring the Trim scrollbar.
The Fader switch allows the level update for the selected channels. If the Fader button is not selected, none of the selected channels are going to be updated with the new level. The Mute switch allows the mute status update.
From the channel matrix, select the channels you want updated. The All and Reset buttons select On or Off for all the channels, then you can add or subtract required channels with the matrix.
Set the From Time Code location where you want to start the update, and the To Time Code location where you want to end the update. You can do this by clicking on their boxes and entering the required Time Code location with the keyboard, or by moving the mouse to the required position on the Mix Event Window and then clicking the left mouse button to enter the corresponding Time Code location.
When the setting is ready, click the OK button to start the update process.
At the end of the update process you can start another update with a new setting or click the Cancel button to quit the Update Mix Window.

4.4.2 Copying a Channel



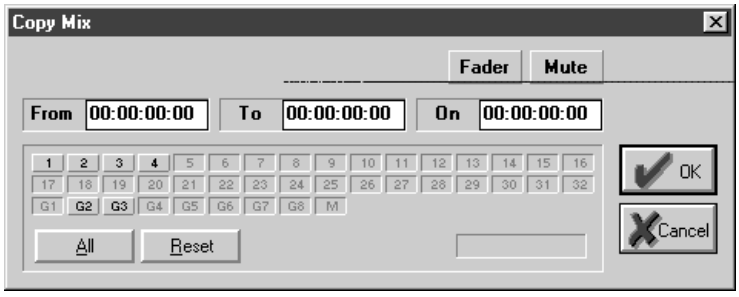
This command allows you to copy channel information to others channels, or to itself from one Time Code location to another Time Code location.
Press the *Fader* toolbar button or select *Copy Fader* from the Edit Menu. You are then presented with the Copy Fader Window.
From within the Fader box, pressing the roll down switch will give a complete list of all available channels. Highlight the one to be copied and the list rolls up leaving the selected channel in the window.
The Fader switch allows you to copy the channel level, and the Mute switch allows you to copy the mute status.
From the channel matrix, select which channels are going to get the copy. The All and Reset switches select On or Off for all the channels, then you can add or subtract required channels with the matrix.
Set the From Time Code location where you want to start the copy of the source channel. Set the To Time Code location where you want to end the copy of the source channel. Then set the On Time Code location where the source channel is going to be copied to the selected channel(s). You can do this by clicking on their boxes and entering the required Time Code location with the keyboard or by moving the mouse to the required position on the Mix Events Window and then clicking the left mouse button to enter the corresponding Time Code location.
When the setting is ready, click the OK button to start the Copy process.
At the end of the Copy process you can start another copy with a new setting or click the Cancel button to quit the Copy Fader Window.

4.4.3 Copying a Snapshot



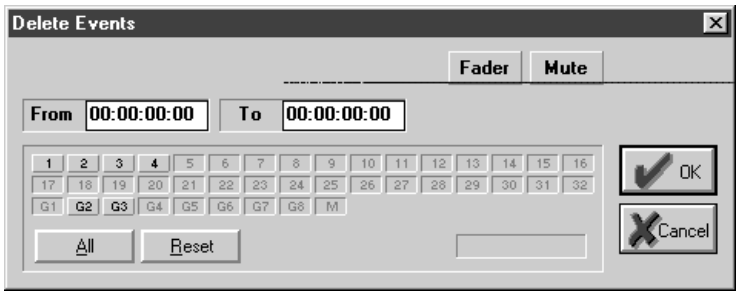
This command allows you to copy a Snapshot to selected channels from one point in Time Code to another. It is useful to start a mix without rerunning the mix from tape.
Press the *Snap* toolbar button or select *Copy Snapshot* from the Edit Menu. You are then presented with the Copy Snapshot Window.
From within the Snapshot box, pressing the roll down switch will give you a complete list of all of the snapshots. Highlight the one to be copied and the list rolls up leaving the selected snapshot in the window.
The Fader switch allows you to copy the channel level, and the Mute switch allows you to copy the mute status.
From the channel matrix, select which channels are going to get the copy, use the All or Reset switches to make the selection easier. The All and Reset switches select On or Off for all the channels, then you can add or subtract required channels with the matrix.
Set the From Time Code location when you want to start the copy, and the To Time Code location when you want to end the copy. You can do this by clicking on their boxes and entering the required Time Code location with the keyboard or by moving the mouse to the required position on the Mix Events Window and then clicking the left mouse switch to enter the corresponding Time Code location.
When the setting is ready, click the OK switch to start the Copy process.
At the end of the Copy process you can start another copy with a new setting or click the Cancel switch to quit the Copy Snapshot Window.

4.4.4 Copying a Mix



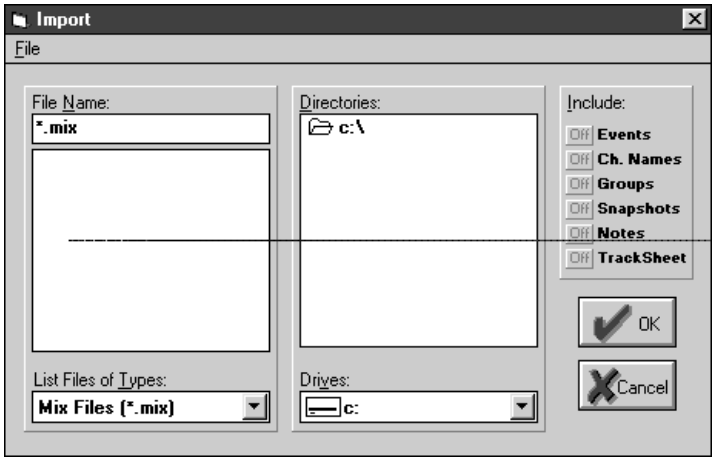
This command allows you to copy part of a mix from one Time Code location to another Time Code location at a specified time location.
Press *Mix* toolbar button or select the *Copy Mix* from the Edit Menu. You are then presented with the Copy Mix Window.
The Fader switch allows you to copy the channel level, and the Mute switch allows you to copy the mute status.
From the channel matrix, select which channels are going to be copied. The All and Reset buttons select On or Off for all the channels, then you can add or subtract required channels with the matrix.
Set the From Time Code location where you want to start the copy. Set the To Time Code location where you want to end the copy, and the On Time Code location where the selected channels are going to be copied. You can do this by clicking on their boxes and entering the required dates with the keyboard or by moving the mouse to the required position on the Mix Events Window and then clicking the left mouse button to enter the corresponding Time Code location.
When the setting is ready, click the OK button to start the Copy process.
At the end of the Copy process you can start another copy with a new setting or click the Cancel button to quit the Copy Mix Window.

4.4.5 Deleting Events from the Mix



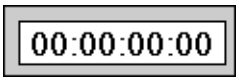
This command is very similar to the Copy Snapshot command. The difference is the channel's level is set to the maximum attenuation and the channel's mute is set to off.
Press *Delete* tool or select the *Delete Events* from the Edit Menu. You are then presented with the Delete Events Window.
The Fader switch allows to delete the level events, and the Mute switch allows to delete the mute events.
From the channel matrix, select the channels for which the events are going to be deleted. The All and Reset switches select On or Off for all the channels, then you can add or subtract required channels with the matrix.
Set the From Time Code location where you want to start deleting, and the To Time Code location where you want to end the deleting. You can do this by clicking on their boxes and entering the required Time Code location with the keyboard or by moving the mouse to the required position on the Mix Events Window and then clicking the left mouse button to enter the corresponding Time Code location.
When the setting is ready, click the OK switch to start the deleting process. At the end of the deleting process you can start another delete with a new setting or click the Cancel switch to quit the Delete Events Window.

4.4.6 Importing Data



The import feature of the software allows you to add specific parts from one mix file to the current mix file, or alternatively start a new mix file with some of the parts from an old mix.
From within the File Menu there is an option called *Import*, selecting this brings up the Import Window.
The Import Window is similar in operation to the Open and Save Windows, but in addition to the file selecting tools you will find six check boxes to the right hand side of the window, which allow you to select which parts of the selected file to import into the current mix.
Once the file has been selected and the options decided, selecting the OK switch will import those options into the current mix, overwriting the current data. It is not possible to add just a section of events.

4.5 Synchronization



Since every automated process only makes sense within a specific context of circumstances, we must ensure that there is a reliable link in time between our dynamic mixing session and the audio program we want to control. This link is usually called synchronization.
From the range of possibilities, there are two methods which are most commonly used :

SMPTE
The SMPTE signal is a so-called LTC-type signal (Longitudinal Time Code) that is used on analog tape recorders and on the audio path of video tape recorders (VTR). Each position on the tape carries a label that corresponds directly to the time elapsed since the start of coding. SMPTE has been developed to synchronize sound to movie, therefore the link in time resolution is related to frames:

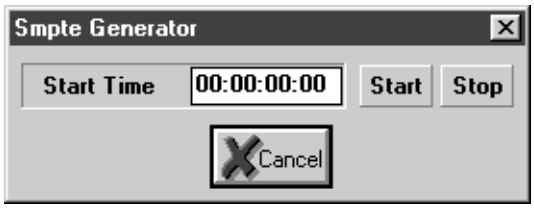
hours : minutes : seconds : frames

Different frame rates (pictures per second) are used all over the world, and consequently it is necessary to indicate which rate has been used for encoding the (audio/video) tape. While home movies sometimes work with 24 pic./sec., 25 or 30 pic./sec. are used in Video/TV applications. You can configure the CYBERMIX Software for one of the standard frame rates within the Options Menu.

MTC
The second method is called MTC (Midi Time Code) and can be regarded as the digital equivalent to SMPTE. The time link resolution is also in frames, but the fundamental difference lies in the way this information is transported. The MTC is a Time Code that is exchanged between MIDI devices, using 7-bit serial data transfer.

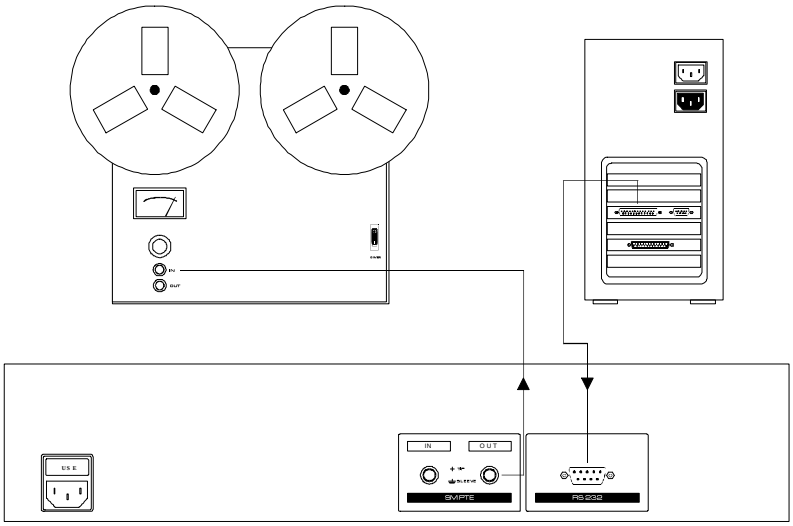
The CYBERMIX System supports both possibilities. It can be used to :
- generate SMPTE signals e.g. for coding tapes
- read SMPTE and synchronize the host PC to it
- read SMPTE and generate MTC on the Midi Output
- synchronize the host PC to MTC at the Midi Input

4.5.1 Encoding with Smpte (Generator)



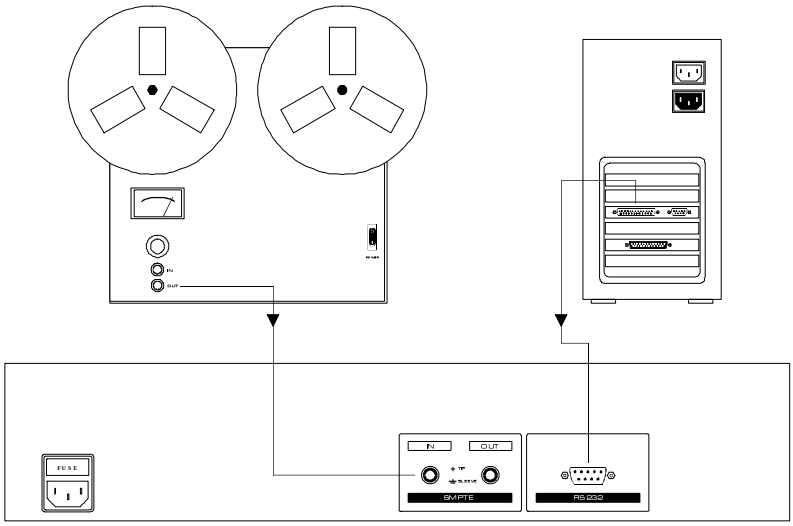
If you want to encode a new tape, consider that all your equipment should support the selected frame rate. Usually a new multitrack tape is striped with Time Code from the beginning right to the end before the session commences. This ensures a consistent Time Code signal for the entire tape, which is very important if the exact length of the session is not known in advance (see chapter 1.8).

Note: It is not possible to append Time Code if your recording exceeds the coded area on the tape !



The SMPTE signal is an analog signal at line level, which can be recorded on any (multi-track or VTR) machine with analog inputs. In analog multitrack recording Time Code usually goes down on the edge of the tape, with the adjacent track left clear (Guard Band) to stop bleeding between recorded tracks and code. In order to minimize crosstalk to other audio paths, a recording level of about -15 to -10dB is recommended.
Digital formats do not waste any audio tracks on Time Code: a separate sync is provided, usually at an extra expense.
If you call up the Smpte Menu you can put in the correct start offset and begin the generation of Time Code at the SMPTE Output by clicking on Start (see chapter 1.8).

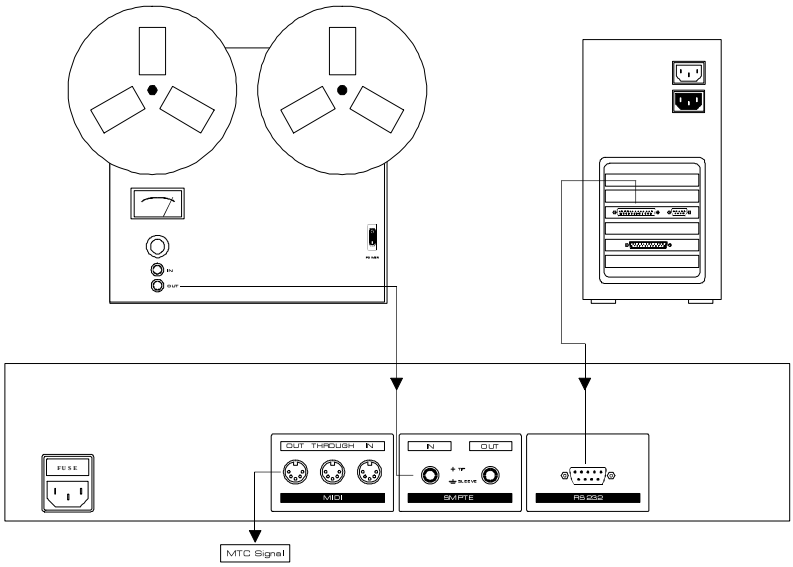
4.5.2 Synchronizing to a Smpte Source (Reader)



Once a tape has been encoded, the Time Code signal can be used to synchronize the host PC to it. You can directly connect the coded track to the SMPTE Input Jack at the back of the CYBERMIX. As soon as the SMPTE signal is detected, the Real Time Counter display will change its color from black to red and show the actual position.

4.5.3 Transforming Smpte into MTC

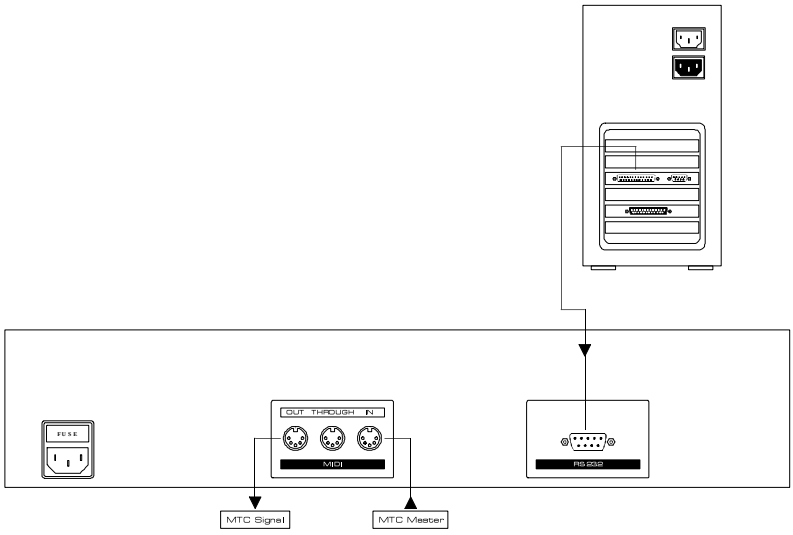
If a SMPTE signal is present at the SMPTE Input Jack, the host PC will automatically synchronize to it. At the same time the corresponding MTC signal is transmitted to the MIDI Out. You can connect sequencers, drum computers or other MIDI devices, that shall be synchronized to the actual tape position to this socket. If you want to use the same MIDI Port for transporting other MIDI Information like Note-On, Note-Off, Program Change, Control Change etc., you must realize that only a small amount of the MIDI Transfer Capacity is available when a continuous Time Code is sent.



4.5.4 Synchronizing to MTC

If you are working in a pure MIDI environment, you may not need to use the analog SMPTE signal to synchronize the CYBERMIX to your sequencers. In this case, you simply connect the MIDI Output of your MTC master unit to the MTC Input of the CYBERMIX. Now you can configure the master sequencer/drum computer to transmit MTC, and the CYBERMIX will automatically synchronize to it.

Note: Take care that every device in your setup is using the same Frame Rate !

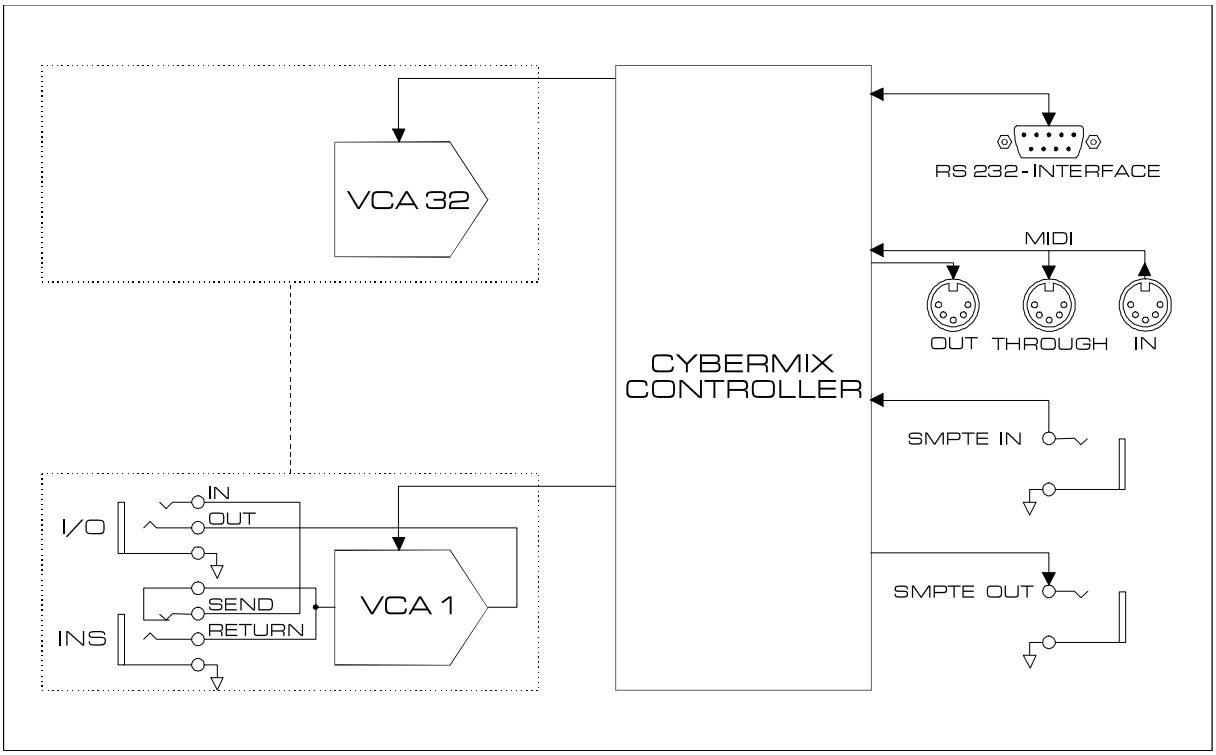


5. Basic Applications

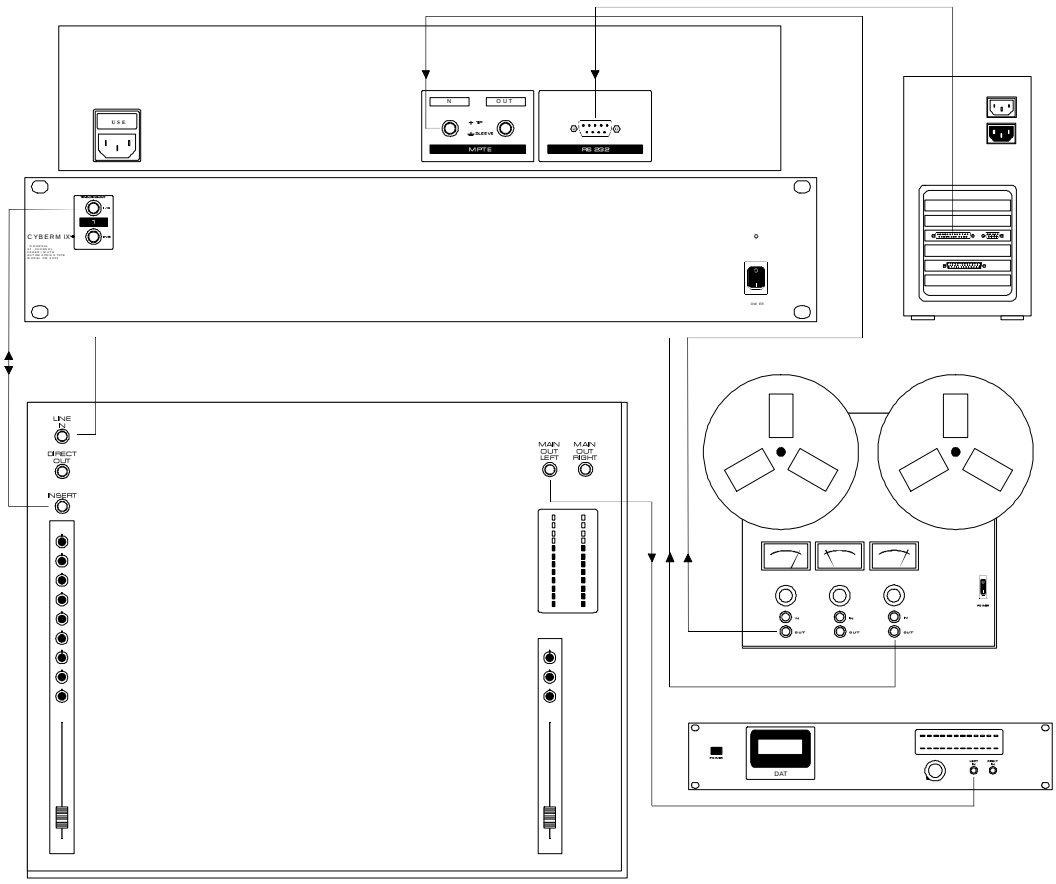
The previous chapter described the editing facilities of the CYBERMIX, the means of synchronization supported by the CYBERMIX and how the necessary parameters can be accessed. Now we want to lift our lid on some standard examples for synchronization setups.

5.1 Mixing Automation and Analog Recording

The CYBERMIX is designed to control the level of various types of audio signal sources, except microphones which require preamplification. Even though this is not the only possibility, a standard application would be controlling the signal levels at the Insert Point of mixing consoles. Since the Insert often is built as a Stereo Jack where the Tip is the Send-Contact and the Ring is the Return-Contact, the CYBERMIX provides Jacks for connecting it directly (1:1) to the Insert Point, using ordinary stereo cables.



As we mentioned in chapter 4.5, every automation requires the correct timing in relation to the program that is to be controlled by it. If we want to control the level of audio signals on a multi track recorder dynamically, we need to establish a link between the tape recorder and the automation system. This is performed by writing an synchronization code on one track of the tape machine. Each time the machine is running it transmits the information of the actual tape position to the automation. Since the SMPTE signals have a very unpleasent recognizable sound, it is recommended to use a track on the edge of the tape for coding it, and to use recording levels of about -15dB (see chapter 4.5)



This picture shows a typical application for the BEHRINGER CYBERMIX Fader Automation.
Note : Only one channel of stereo signals is shown).
The analog tape contains all analog signals which you wish to mix. Channel one provides the SMPTE signal and channel two is blank. Let us assume you want to record the complete mix on a two track DAT tape :

- At first switch off all items !
- Connect the CYBERMIX Automation to the Host PC by using the RS232 Interface cable.
- Connect channel one of the analog tape recorder (SMPTE signal) to the Line In of the first mixing console channel (use a Mono-Jack cable). While Time Code is running, this gives you the choice to stop the synchronization signal whenever you want to, simply by fading out channel one. This can be very useful when you want to make changes to the mix, but you are not able to because Time Code is running. Fade in channel one to proceed the synchronization.
- Install a cable link between Direct Out of the first mixer channel and SMPTE In on the CYBERMIX (use Mono-Jack cable).
- Connect all analog tape channels to the Line Ins on the mixer (use Mono-Jack cable).
- Connect the mixer Inserts of all channels to the I/Os of the CYBERMIX (use Stereo-Jack cable)
- If you want to use compressors or other items on the inserts, you must use the Inserts on the CYBERMIX (use Stereo-Jack cable).
- Connect the two DAT recorder channels to the mixer outputs (use Mono-Jack cable).
- Switch on all items.
- When the CYBERMIX control light is on start the CYBERMIX Software on the Host PC.
- This is the best time to name the channels within the software to prevent confusion.
- You can edit the channels on the screen and when the mix is ready, record it on the DAT tape.

5.2 Matching Audio to a Video Tape

Supposing you would like to match your own music or sound to a movie, a consistent synchronization between the different sources must be ensured. As we discussed in chapter 4.5 already, the SMPTE Time Code has been created exactly for this purpose.
At the beginning of the audio production (speech, music, environmental sounds) the video tape must be coded with the appropriate SMPTE signal, to provide a reference point for the remaining stages of work. This procedure is just the same as for coding a multitrack tape (see chapter 4.5.1). If you intend to edit precisely to a specific frame, you must set the CYBERMIX Software to the frame rate of your VTR. Proceed coding the video tape according to chapter 4.5.1. Obviously, you must connect the SMPTE output of the CYBERMIX with the audio input of your VTR. If your video machine is able to record sound and movie independently, you can match the sync after preparing all the movie sequences.
Note : If your VTR records video and sound signals concurrently, you have to provide the Time Code signal while taking the pictures !

Once a video tape has been coded and the corresponding audio track of the recorder has been connected to the CYBERMIX SMPTE Input Jack (see chapter 4.5.2), the CYBERMIX will synchronize the automation software on the host PC to the running Time Code.
You can now view the video sequences and the screen display of the Real Time Counter will show the actual position in red color. Thus, all mix events that have previously been recorded or edited are synchronized to the pictures of the movie, provided that the corresponding automation channels are in Play Mode. The Midi Output Jack concurrently carries the equivalent MTC signal, which can be used to synchronize Midi Sequencers, Hard disk Recorders or Drum computers to the video.
When all your audio components have been matched and automated to the video you can copy the audio mix together with the movie signals to a second VTR. The result will be a video tape with perfectly suited audio.

6 Appendix

6.1 Technical Data

Analogue Audio Inputs

Type	Unbalanced 6.3 mm Stereo Jack (Tip)
Impedance	100 kOhms
Nominal Operating Level	-10 dBV to +4 dBu
Max. Input Level	+21 dBu

Analogue Audio Outputs

Type	Unbalanced 6.3 mm Stereo Jack (Ring)
Impedance	50 Ohms
Max. Output Level	+22 dBu
Bandwidth	5 Hz to 100 kHz +0, -1 dB
THD + N	1 kHz, 0 dBu : 0.015 %
	+10 dBu : 0.1 %
Signal to Noise Ratio	1 kHz / +22 dBu : 116 dB
Crosstalk Rejection	typical › 88 dB

SMPTE Input

Type	Transformer DC-Decoupled
Sensitivity	typical -30 dBu

SMPTE Output

Type	Transformer DC-Decoupled
Output Level	+7 dBu (Peak)

MIDI Interface

Type	5-Pin DIN-Socket In / Out / Thru

Serial Interface (RS232)

Baud Rate	19,200 bps

Power Supply

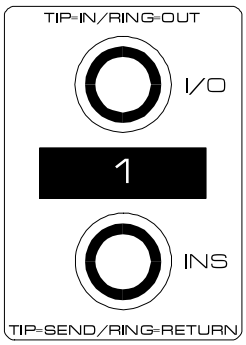
Mains Voltages	100-120 / 200-240 VAC 50-60 Hz
Power Consumption	40 Watts
Fuse	315 mA (100-120 V)
	160 mA (200-240 V) slow-blow
Mains Connection	Standard IEC receptable

Physical

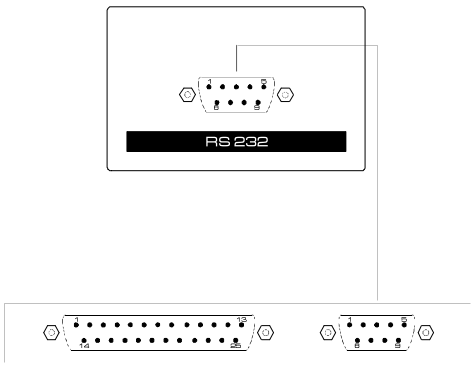
Dimensions (H * W * D)	3-1/2" (89 mm) * 19" (482.6 mm) * 12" (304.8 mm)
Net weight	5 kg
Shipping weight	6.6 kg

6.2 Connectors

While reading through all these pages you were confronted with different types of cables and connectors. To prevent you from making mistakes we now want to show you the correct pinout and layout of each connector.



RS232 interface connector :
The cable that is used to connect the CYBERMIX to the Host computer is a serial interface cable with 1:1 pinout.



Stereo Jack Cable :
These cables are used to connect i.e. the mixer inserts to the I/O on the CYBERMIX.

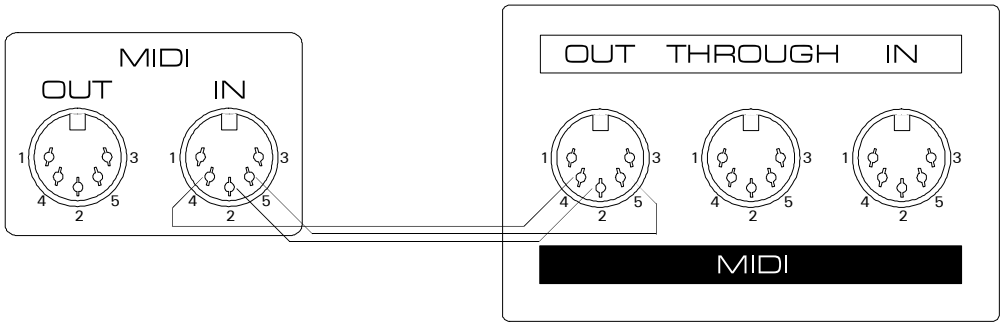


Mono Jack Cable :
These cables are used to connect i.e. the mixer channels Line Out of the analog tape recorder.



MIDI Connectors :
The MIDI connector consists of five pins. The pins 1 and 3 are not connected. Pin 2 is connected to the cable shield. Via pins 4 and 5 the signal is transmitted.

Interconnection		Function
Pin Number (Device 1)	Pin Number (Device 2)	
2	2	Shield
4	4	Signal pos.
5	5	Signal neg.



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7.0 WARRANTY

§ 1 WARRANTY REGISTRATION

Warranty Registration must be completed and returned to Behringer GmbH within 8 days from the date of purchase.

§ 2 WARRANTY

Behringer GmbH warrants the materials, workmanship and proper operation of this Behringer product for a period of one year from the original date of purchase. If any defects are found in the materials or workmanship, or if the product fails to function properly within the specified warranty period, Behringer GmbH will repair or replace the product, at its discretion.

§ 3 RETURN AUTHORIZATION NUMBER (RA)

1. To obtain factory service call Behringer GmbH for a Return Authorization Number. RA numbers are necessary for proper tracking of your product.. Call: Tel (0)21 54 / 9206 - 0 (10 am to 5 pm weekdays (MET))

2. The product must be returned in its original shipping carton, freight prepaid to:

   BEHRINGER Spezielle Studiotechnik GmbH
   Otto-Brenner-Str. 4
   FRG - 47877 Willich/Munchheide II
   Federal Republic of Germany

§ 4 WARRANTY AUTHORITY

Behringer GmbH reserves the right to inspect any products which may be the subject of any warranty claim before repair or replacement is carried out.
Behringer GmbH may, at its discretion, require proof of the original date of purchase (dated copy of original retail dealer's invoice). Final determination of warranty coverage lies solely with Behringer GmbH. Any Behringer product deemed eligible for repair or replacement under the terms of this warranty will be repaired or replaced within 30 days of receipt of the product at Behringer's factory. Products which do not meet the terms of this warranty will be repaired and returned C.O.D. with an invoice for labor, materials, return freight and insurance. Products repaired under warranty will be returned freight prepaid by Behringer GmbH, to any location within the boundaries of the Federal Republic of Germany. Outside of Germany, products will be returned freight collect.

§ 5 WARRANTY TRANSFERABILITY

This warranty is extended to the original purchaser, but it is not transferable to anyone who may subsequently purchase this product.

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